IN THE CLAIMS

1. (Currently amended) A shower head for supplying a reaction gas to a wafer in a process chamber, the shower head ~~comprising:~~

~~a plurality of plates comprising~~ comprising circular plates, each of the circular plates arranged substantially parallel to each other in a vertically stacked arrangement, each of the circular plates having substantially the same diameter, each of the circular plates including gas paths for supplying a reaction gas to ~~a wafer; and~~ the process chamber,

~~a cooling system comprising a plurality of coolant inlets and a plurality of coolant outlets formed in a lower one of the plurality of plates, and further comprising a plurality of inner cooling lines configured to connect each of the plurality of coolant inlets to one of the plurality of coolant outlets.~~ a lower one of the circular plates including cooling lines, coolant inlets, and coolant outlets, each of the cooling lines connecting one of the coolant inlets to one of the coolant outlets.

2. (Currently amended) [[A]]The shower head ~~according to~~ of claim 1, ~~wherein~~ the ~~plurality of~~ coolant inlets and coolant outlets disposed along a circumferential edge of the lower one of the circular plates, ~~and the plurality of coolant outlets are formed on a side of the lower plate~~ the coolant inlets arranged such that each coolant inlet is separated from an adjacent coolant inlet by an angular spacing that is substantially equal to 360 degrees divided by a total number of coolant inlets, the coolant outlets arranged such that lines drawn from each of the outlets to a radial center of the lower one of the circular plates divide the lower one of the circular plates into substantially equal parts.

3. (Currently amended) ~~A shower head according to claim 1, wherein at least four coolant inlets, at least four coolant outlets, and at least four inner cooling lines are formed.~~ The shower head of claim 2, the coolant inlets consisting of four coolant inlets, the coolant outlets consisting of four coolant outlets, the cooling lines consisting of four cooling lines.

4. (Currently amended) ~~A shower head according to claim 1, wherein the plurality of coolant inlets are formed on a first side of the lower plate, the plurality of coolant outlets are formed on a second side of the lower plate, and the plurality of inner cooling lines are formed~~

~~parallel to each other.~~ The shower head of claim 1, the lower one of the circular plates including a circumferential edge that consists of a first semicircular portion and a second semicircular portion, the coolant inlets arranged along the first semicircular portion, the coolant outlets arranged along the second semicircular portion, the cooling lines arranged such that they are parallel to one another.

5. (Currently amended) ~~A shower head according to claim 1, wherein a first coolant inlet is connected to a first coolant outlet by a first inner cooling line, wherein a second coolant outlet is connected to a second coolant inlet by a second inner cooling line, and wherein the second coolant outlet is located adjacent to the first coolant inlet on a first side of the lower plate.~~ The shower head of claim 2, the coolant inlets and coolant outlets disposed along the circumferential edge of the lower one of the circular plates such that the coolant inlets and coolant outlets are arranged in pairs consisting of one coolant inlet and one coolant outlet, an angular spacing between the one coolant inlet and the one coolant outlet of each pair less than the angular spacing between the coolant inlets and an angular spacing between the coolant outlets.

6. (Currently amended) ~~A shower head according to claim 1, wherein a first coolant outlet is connected to a first coolant inlet by a first inner cooling line, and wherein the first coolant outlet is positioned approximately 90 degrees from a position of the first coolant inlet along an circumferential edge of the lower plate.~~ The shower head of claim 3, the four cooling lines arranged such that a path of each of the four cooling lines within the lower one of the circular plates forms two legs of a right triangle.

7. (Currently amended) ~~A shower head according to claim 6, wherein a second coolant inlet is located adjacent to the first coolant outlet, wherein the second coolant outlet is connected to a second coolant inlet by a second inner cooling line, and wherein the second coolant outlet is located approximately 90 degrees from a position of the second coolant inlet along the edge of the lower plate, and wherein the second coolant outlet is located approximately 180 degrees from the first coolant inlet along the edge of the lower plate.~~ The shower head of claim 1, the lower one of the circular plates including a circumferential edge that consists of a

first semicircular portion and a second semicircular portion, wherein a total number of coolant inlets and a total number of coolant outlets are both even numbers, half of the coolant inlets and half of the coolant outlets arranged along the first semicircular portion, the other half of the coolant inlets and the other half of the coolant outlets arranged along the second semicircular portion, the cooling lines arranged such that they are parallel to one another.

8. (Currently amended) ~~A shower head according to~~ The shower head of claim 1, further comprising:

a first outer cooling line arranged outside the lower ~~plate~~ lower one of the circular plates to connect the ~~plurality of~~ coolant inlets; and

a second outer cooling line arranged outside the lower ~~plate~~ the lower one of the circular plates to connect the ~~plurality of~~ coolant outlets.

9. (Currently amended) An apparatus for forming a thin film, said apparatus comprising:

a process chamber having a bottom wall that defines a lowermost boundary of the process chamber;

a heater stage ~~located in a lower portion of the process chamber, said~~ disposed within the process chamber and entirely above the bottom wall, the heater stage configured to support a wafer and to heat the wafer to a high temperature;

a shower head ~~located in an upper portion of the process chamber, said~~ disposed above the heater stage, the shower head configured to supply a reaction gas to the wafer; and

a separating device ~~arranged between a bottom of the process chamber and a bottom of the heater stage~~ disposed beneath the heater stage, a lower surface of the separating device disposed in contact with the bottom wall, ~~said~~ the separating device configured to separate the heater stage from the bottom ~~of the process chamber~~ wall and to reduce a volume of processing space within the process chamber.

10. (Cancelled)

11. (Currently amended) ~~An apparatus according to claim 9, wherein the separating device is located in a lower portion of the process chamber and contacts the bottom of the heater stage.~~ The apparatus of claim 9, the heater stage configured to have an adjustable height within the process chamber, a bottom of the heater stage configured to contact an upper surface of the separating device at a lower position of the heater stage, wherein a position of the separating device remains fixed relative to the process chamber.

12. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 9, wherein the separating device is configured to separate the heater stage and the process chamber by a uniform distance.

13. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 12, wherein the heater stage and the process chamber are separated by about ~~2-10cm~~ 2 to about 10 cm.

14. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 9, wherein the separating device is formed of a heat-resistant material.

15. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 14, wherein the heat-resistant material is a ceramic material.

16. (Currently amended) ~~An apparatus according to claim 9,~~ The apparatus of claim 11, wherein the separating device is ~~rim-shaped~~ ring shaped, ~~and is configured to closely adhere to the bottom of the heater stage~~ the upper surface of the separating device configured to abut a lower surface of the heater stage, a substantial portion of the upper surface of the separating device disposed directly beneath the lower surface of the heater stage.

17. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 9, further comprising:

a shaft installed beneath the heater stage and configured to raise and lower the heater stage; and

a shaft introduction portion configured to introduce the shaft at the bottom of the process chamber.

18. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 17, wherein the shaft introduction portion is formed as a flexible bellows and has a length that varies as the shaft is raised and lowered.

19. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 9, further comprising a process chamber cooling system configured to cool a bottom surface of the process chamber whereon the separating device is located.

20. (Currently amended) An apparatus for forming a thin film, said apparatus comprising:

a process chamber;

a heater stage arranged in a lower portion of the process chamber and configured to support a wafer and to heat the wafer to a high temperature;

a shower head disposed in an upper portion of the process chamber and configured to supply a reaction gas to the wafer, said shower head comprising a plurality of plates having a plurality of gas paths formed therein and a shower head cooling system arranged in a lower plate;

said cooling system comprising a plurality of coolant inlets, a plurality of coolant outlets, and a plurality of independent inner cooling lines for connecting each of the coolant inlets to one of the coolant outlets; and

a separating device arranged between the process chamber and the heater ~~stage to separate a space beneath the heater stage from a process chamber space containing the wafer to reduce a process volume of the process chamber~~ stage, the separating device arranged to separate the heater stage and a bottom of the process chamber by a substantially uniform amount, the substantially uniform amount in the range of about 2 to about 10 cm.

21. (Currently amended) ~~An apparatus according to claim 20, wherein the plurality of coolant inlets and the plurality of coolant outlets are formed along an edge of the lower plate.~~ The apparatus of claim 20, the plurality of plates substantially circular in shape and having

substantially the same diameter, the coolant inlets and coolant outlets disposed along a circumferential edge of the lower plate, the coolant outlets arranged such that each coolant outlet is separated from a nearest adjacent coolant outlet by an angular spacing that is substantially equal to 360 degrees divided by a total number of coolant outlets, the coolant inlets arranged such that lines drawn from each of the inlets to a radial center of the lowermost plate divide the lower plate into substantially equal parts.

22. (Currently amended) ~~An apparatus according to claim 20,~~ The apparatus of claim 21, ~~wherein at least four coolant inlets, at least four coolant outlets, and at least four inner cooling lines are formed~~ the coolant inlets consisting of four coolant inlets, the coolant outlets consisting of four coolant outlets, and the inner cooling lines consisting of four inner cooling lines.

23. (Currently amended) ~~An apparatus according to claim 20, wherein the plurality of coolant inlets are formed on one side of the lower plate, the plurality of coolant outlets are formed on an opposite side of the lower plate, and the plurality of inner cooling lines are formed parallel to each other.~~ The apparatus of claim 20, the plurality of plates substantially circular in shape and having substantially the same diameter, the coolant inlets and coolant outlets disposed along a circumferential edge of the lower plate, the circumferential edge consisting of a first semicircular edge and a second semicircular edge that together form a circle, the coolant inlets disposed along the first semicircular edge, the coolant outlets disposed along the second semicircular edge, and the inner cooling lines disposed parallel to each other.

24. (Currently amended) ~~An apparatus according to claim 20, wherein a first coolant outlet is connected to a first coolant inlet by a first inner cooling line, wherein a second coolant inlet is connected to a second coolant outlet by a second inner cooling line, wherein the second coolant outlet is arranged adjacent to the first coolant inlet on a first side of the lower plate, wherein the first coolant outlet is located adjacent to the second coolant inlet on a second side of the lower plate, and wherein the second side of the lower plate is opposite the first side.~~ The apparatus of claim 21, the coolant inlets and coolant outlets disposed along the circumferential edge of the lower plate such that the coolant inlets and coolant outlets are arranged in pairs

consisting of one coolant inlet and one coolant outlet, an angular spacing between the one coolant inlet and the one coolant outlet of each pair less than an angular spacing between the coolant inlets and an angular spacing between the coolant outlets.

25. (Currently amended) ~~An apparatus according to claim 20, wherein a first coolant outlet is connected to a first coolant inlet by a first inner cooling line, wherein the first inner cooling line has a path that forms an approximately 90 degree angle, said angle having a vertex located at approximately the center of the lower plate.~~ The apparatus of claim 22, the four cooling lines arranged such that a path of each of the four cooling lines within the lower plate consists of two straight lines that intersect at a right angle.

26. (Currently amended) ~~An apparatus according to claim 25, wherein a second coolant inlet is located adjacent to the first coolant outlet, and wherein a second coolant outlet is connected to the second coolant inlet by a second inner cooling line, and wherein the second outlet is located approximately 90 degrees from the second coolant inlet along a circumferential edge of the lower plate, and wherein the second outlet is located approximately 180 degrees from the first coolant inlet along the circumferential edge of the lower plate.~~ The apparatus of claim 20, the lower plate having a substantially circular shape, the lower plate including a circumferential edge that consists of a first semicircular portion and a second semicircular portion, wherein a total number of coolant inlets and a total number of coolant outlets are both even numbers, half of the coolant inlets and half of the coolant outlets are alternately arranged along the first semicircular portion, the other half of the coolant inlets and the other half of the coolant outlets are alternately arranged along the second semicircular portion, and the cooling lines are arranged such that they are parallel to one another.

27. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 20, further comprising:

a first outer cooling line located outside the lower plate and configured to connect the ~~plurality of~~ coolant inlets; and

a second outer cooling line located outside the lower plate and configured to connect the ~~plurality of~~ coolant outlets.

28-31. (Cancelled)

32. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 20, wherein the separating device is formed of a heat-resistant material.

33. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 32, wherein the heat-resistant material is a ceramic material.

34. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 20, wherein the separating device is ~~rim~~ ring shaped and is configured to ~~closely adhere to~~ abut a bottom surface of the heater stage.

35. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 20, further comprising:

a shaft configured to raise and lower the heater stage, said shaft arranged beneath the heater stage; and

a shaft introduction portion configured to contain the shaft at the bottom of the process chamber.

36. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 35, wherein the shaft introduction portion comprises a flexible bellows wall having a variable length depending on the raising and lowering of the shaft.

37. (Currently amended) ~~An apparatus according to~~ The apparatus of claim 20, further comprising a process chamber cooling system arranged in thermal communication with a lower portion of the process chamber, said lower portion of the process chamber supporting the separating device.

38-40. (Cancelled)

41. (New) The apparatus of claim 20, the process chamber having a bottom wall that defines a lower boundary of the process chamber, the separating device disposed such that a bottom surface of the separating device is in physical contact with the bottom wall of the process chamber.